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# New Taxa, New Combinations, and Observations in *Kengyilia* (Poaceae: Triticeae)

Chi Yen and Jun-Liang Yang

Triticeae Research Institute, Sichuan Agricultural University,  
Dujiangyan City 611830, Sichuan, China

Bernard R. Baum

Eastern Cereals and Oilseeds Research Centre, Agriculture and Agri-Food Canada, Central  
Experimental Farm, K.W. Neatby Building, Ottawa, Ontario, Canada, K1A 0C6

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**ABSTRACT.** A new species is described and five new combinations are made in *Kengyilia*. The new taxa are *Kengyilia eremopyroides* and *K. batalinii* var. *villosissima*. *Kengyilia longiglumis* and *K. nana* are reduced to *K. alataavica* var. *longiglumis* and *K. nana* to *K. batalinii* var. *nana*, respectively. *Roegneria carinata*, *Elytrigia kryloviana*, and *Elytrigia pulcherrima* are transferred to *Kengyilia* as *K. carinata*, *K. kryloviana*, and *K. pulcherrima*, respectively.

We first described *Kengyilia* Yen & J. L. Yang in 1990 (Yen & Yang, 1990) and soon afterward added a new species to it (Baum et al., 1991). Subsequently, we provided a synopsis and key to the 16 species of the genus known to us at the time (Yang et al., 1992). Cai and Cui (1995) have since added two more new species. This genus, now with approximately 20 species, is distributed primarily in west China, with some species found in countries west of China. We recently investigated the taxonomic relationships with and differences between its congeners *Roegneria*, *Elymus*, and *Agropyron* (Baum et al., 1995) and provided a key to identify these four genera. We are currently preparing a taxonomic monograph of *Kengyilia*. Toward this goal we are searching for type material in different herbaria.

A recent visit to the Komarov Botanical Institute, St. Petersburg, Russia, during the summer of 1995, by Yen and Yang was carried out to study type material of *Kengyilia*. Morphological examinations of specimens, especially type material, led to the conclusion that a number of species in *Kengyilia* were hitherto misnamed and that other species needed to be incorporated within *Kengyilia*. The purpose of this paper is to document the new combinations and revisions in *Kengyilia* resulting from the examinations carried out during the recent visit to LE.

## MATERIALS AND METHODS

Morphological examinations were performed on herbarium materials, including type collections, from the following herbaria: JSBI, K, LE, NUBD, PE, SAUTI, TK. Characters on these specimens were evaluated for quantitative and qualitative measurements and compared to various pertinent protologues for taxonomic assessment.

## RESULTS—TAXONOMIC TREATMENTS

**1. *Kengyilia alataavica*** (Drobov) J. L. Yang, Yen & Baum var. ***longiglumis*** (Keng & S. L. Chen) Yen, J. L. Yang & Baum, comb. nov. Basionym: *Roegneria longiglumis* Keng & S. L. Chen, Acta Nanking Univ. (Biol.) 1: 83. 1963. *Kengyilia longiglumis* (Keng & S. L. Chen) Yang, J. L., Yen & Baum, Hereditas 116: 27. 1992. TYPE: China. Gansu, on slopes, alt. 2500 m, July 6 1937, T. P. Wang No. 7080 (holotype, PE). Figure 1A.

*Distribution.* China: Gansu, Xiahe; Xinjiang, Yecheng, Taxkorgan and between Wuqia and Turugar, on dry slopes and scree, alt. 2500–3340 m.

This taxon was known hitherto as *K. longiglumis*, from the Chinese material that was examined. Our comparative studies proved that *K. longiglumis* is a taxonomic synonym of *K. alataavica*. The Chinese material is here recognized as a separate variety; it differs from *K. alataavica* var. *alataavica* by its hairy leaf sheaths and culms, and by the short rounded lodicules (Fig. 1A). The pointed lodicules of the typical variety are shown in Figure 1B.

**2. *Kengyilia batalinii*** (Krassnov) J. L. Yang, Yen & Baum var. ***villosissima*** Roshevitz ex Yen, J. L. Yang & Baum, var. nov. TYPE: Turkestan. Pamir, near Karakuli Lake, July 5 1901 [collector & collection no. unretained] (holotype, LE). Figure 2.



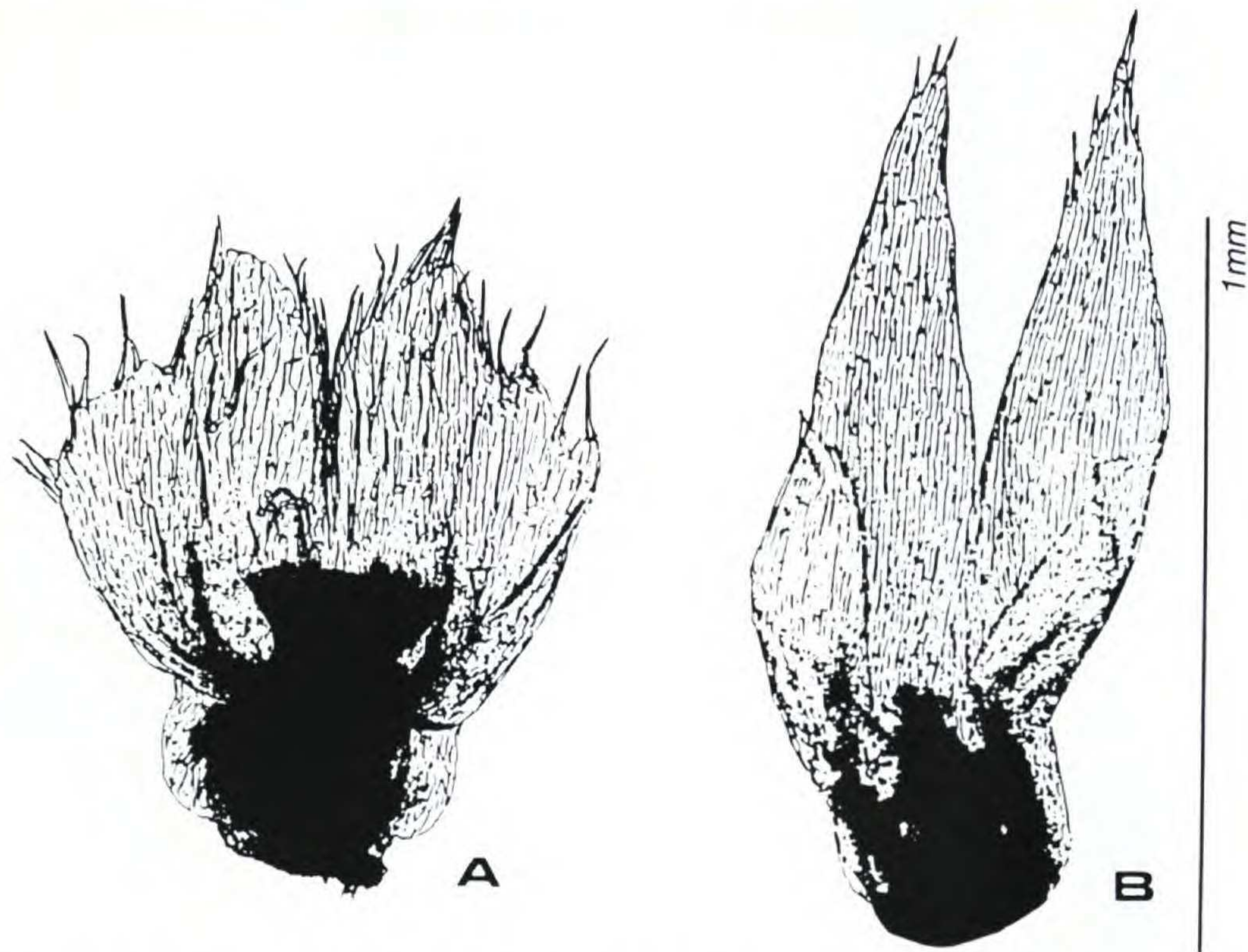


Figure 1. Lodicules of *K. alata* (Drobov) J. L. Yang, Yen & Baum. —A. Typical lodicules of variety *longiglumis* (Keng & S. L. Chen) Yen, J. L. Yang & Baum. —B. Lodicules found in variety *alata*.

*Kengyilia batalinii* (Krassnov) J. L. Yang, Yen & Baum affinis, sed laminis supernis dense villosis, laminis infernis glabris vel sparsim ciliolatis, spicis dense albus-villosis, glumis dense pubescentibus, lemmatibus dense villosis differt.

This variety differs from the typical variety by its leaf blades villous on the upper surface and glabrous or sparsely ciliate on the lower surface, the spikes densely white villous, and the glumes and the lemmas densely villous. See key below to identify this variety and the other two in *K. batalinii*.

*Distribution.* Turkestan.

**3. *Kengyilia batalinii*** (Krassnov) J. L. Yang, Yen & Baum var. **nana** (J. L. Yang, Yen & Baum) Yen, J. L. Yang & Baum, comb. nov. Basionym: *Kengyilia nana* J. L. Yang, Yen & Baum, Canad. J. Bot. 71: 339–345. 1993. TYPE: China. Taxkorgan, Pamir Plateau, in alpine steppe, alt. 4200 m, Sep. 6 1987, C. Yen et al. 870502 (holotype, SAUTI).

This variety differs from the typical variety in having leaf sheaths with densely pubescent or ciliate margins, leaf blades that are densely hairy on the adaxial surface and shortly pubescent on the abaxial surface, and slightly smaller spikes. It grows at higher elevations than variety *batalinii*.

*Distribution.* China.

This taxon was known hitherto as *K. nana*, now an established taxonomic synonym of *K. batalinii*.

The three varieties in *K. batalinii* may be distinguished by the following key.

- 1a. Leaf blades glabrous . . . . . var. *batalinii*
- 1b. Leaf blades beset with hairs at least on upper surface.
  - 2a. Leaf blades villous on upper surface, glabrous or sparsely ciliate on lower surface . . . . . var. *villosissima*
  - 2b. Leaf blades with short pubescence on upper surface, and with dense hairs on lower surface . . . . . var. *nana*

**4. *Kengyilia carinata*** (Ovczinnikov & Sidorenko) Yen, J. L. Yang & Baum, comb. nov. Basionym: *Roegneria carinata* Ovczinnikov & Sidorenko, Fl. Tajik SSR 1: 505 (No. 310). 1957. TYPE: Russia. In the lower part of the northern slope of Jiptyk valley—a tributary of the Isfar, 28 June 1938, Mikeschin, G. No. 79 (holotype, LE). Figure 3.

This species differs from *K. alaica* in having sturdy, densely tufted culms with 4–5 nodes, broad leaves, dense spikes, and glumes sparsely covered with long hairs.

Tzvelev (1976) treated *R. carinata* Ovcinnikov & Sidorenko as a synonym of *Elytrigia batalinii* subsp. *alaica* (Drobov) Tzvelev, based on the Mikeschin specimen of 26 July 1938, No. 79, probably by mistake confusing it with No. 81. The herbarium of the Komarov Botanical Institute (LE) has two



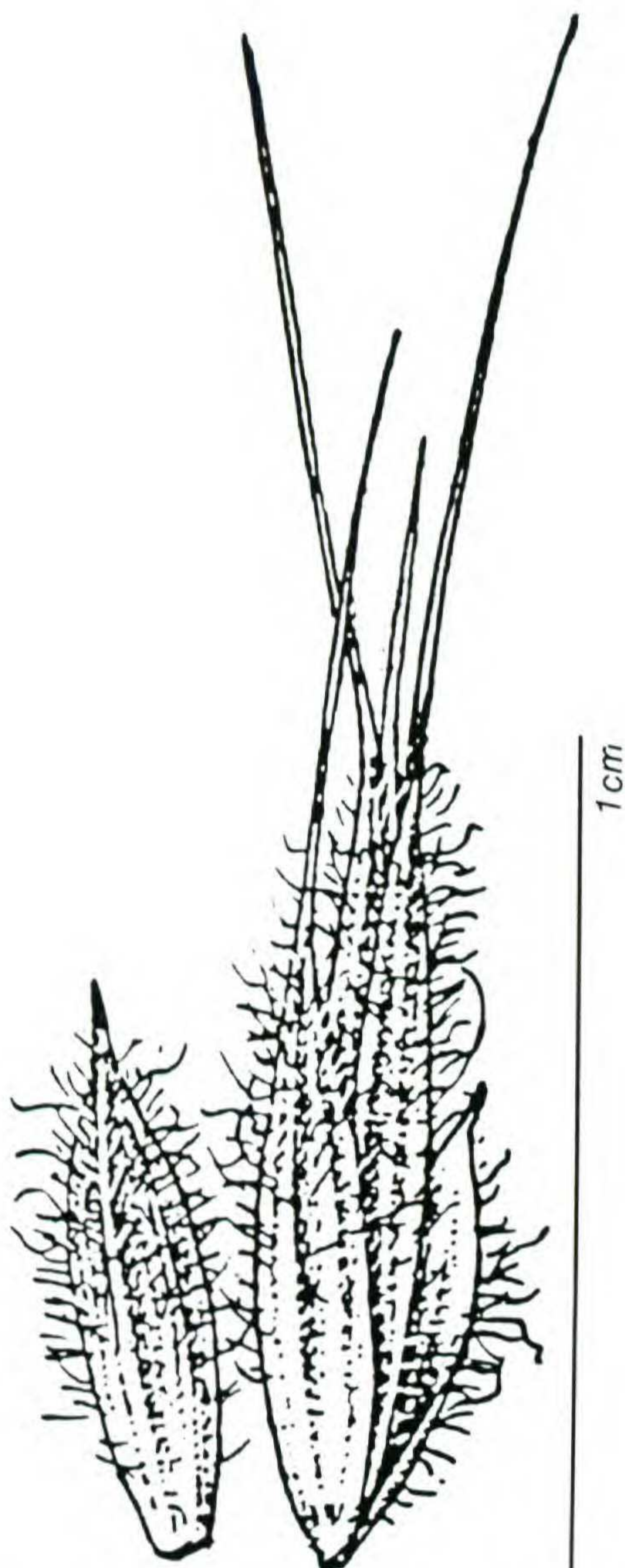


Figure 2. Spikelet of *Kengyilia batalinii* (Krassnov) J. L. Yang, Yen & Baum var. *villosissima* Roshevitz ex Yen, J. L. Yang & Baum, with the hairy glumes and lemmas. Left, upper glume.

sheets collected by J. B. Mikeshin. One is the type. The other is No. 81, collected on 10 Aug. 1938. Nevski annotated the type as *Roegneria abolinii* (Drobov) Nevski f. *breviaristata* Nevski. In 1956, P. N. Ovczinnikov annotated it as *Roegneria carinata*. The subsequent year he published *R. carinata* with Sidorenko. Thus, No. 79 is the holotype. In 1958 Melderis annotated this specimen as *Agropyron carinatum*. Specimen No. 81 is a loosely caespitose, delicate grass with 1–2 nodes, and culm and narrow leaves situated at the base of the plant, identified as *Kengyilia alaica* (Drobov) J. L. Yang, Yen & Baum. In March 1959 Tzvelev affixed the following annotation on this specimen “*Roegneria carinata* Ovczinnikov et Sidorenko Topotype = *Agropyron alaicum* Drob.” We agree that it is “*A. alaicum* Drobov,” but it is not “*R. carinata*,” i.e., *Agropyron*

*alaicum* and *Roegneria carinata* are different species.

5. ***Kengyilia eremopyroides*** Nevski ex Yen, J. L. Yang & Baum, sp. nov. TYPE: China. “Lacus Orin-Nor sole argilloso-sabuloso porce,” alt. 3962 m (13000 ft.), 10/30 July 1884, N. M. Przewalski No. 339 (holotype, LE). Figure 4.

*Kengyiliae melantherae* (Keng) J. L. Yang, Yen & Baum affinis, sed culmis sub inflorescentiis dense pubescentibus, laminis dense pilosis, spicis brevioribus (4–4.5 cm) et angustioribus, lemmatibus dense hirsutis non villosis differt.

This species resembles *Kengyilia melanthera* (Keng) J. L. Yang, Yen & Baum but differs in having the culm densely pubescent below the spikes, leaf blades that are densely pilose on both surfaces, narrower and shorter spikes, and densely long hirsute (but not villous) lemmas.

Perennials, with short rhizomes; culms densely caespitose, erect, 31–37 cm tall, about 1.5–2 mm diam., glabrous except for the upper internode pubescent below the spike, with 2 nodes. Leaf sheaths glabrous; ligules scarious membranous, truncate, about 0.5 mm long; leaf blades flat, (1.5–)2–5.5 cm long, 2.5–3 mm wide, their adaxial surface pilose and their abaxial surface densely pilose. Spikes erect, oblong, (3.5–)4–4.5 cm long, 8–10 mm wide; rachis internodes densely pilose, the uppermost internodes 1.5–2 mm long, the lowermost 5–7 mm long; spikelets ovoid, slightly secund, straw or purple colored, with 4–6 florets, 10–11 mm long (excluding awns); rachilla internodes 0.8–1.2 mm long, densely puberulous; glumes unequal, ovoid, 3–5-nerved, glabrous, acute, mucronate, first glumes 4–4.5 mm long, second glumes 4.5–5 mm long; lemmas ovate-oblong, 7–8 mm long, densely hirsute, apex acuminate ending with a 3–4 mm scabrous long awn; palea shorter than lemma, 0.5 mm long, with an emarginate apex, with keels sparsely ciliolate in their upper part; anthers black, 2 mm long.

**Distribution.** China, known only from the type locality.

The type specimen was initially annotated as a new species of Wheatgrass, namely *Agropyron eremopyroides*, by Nevski in 1931, but was never published.



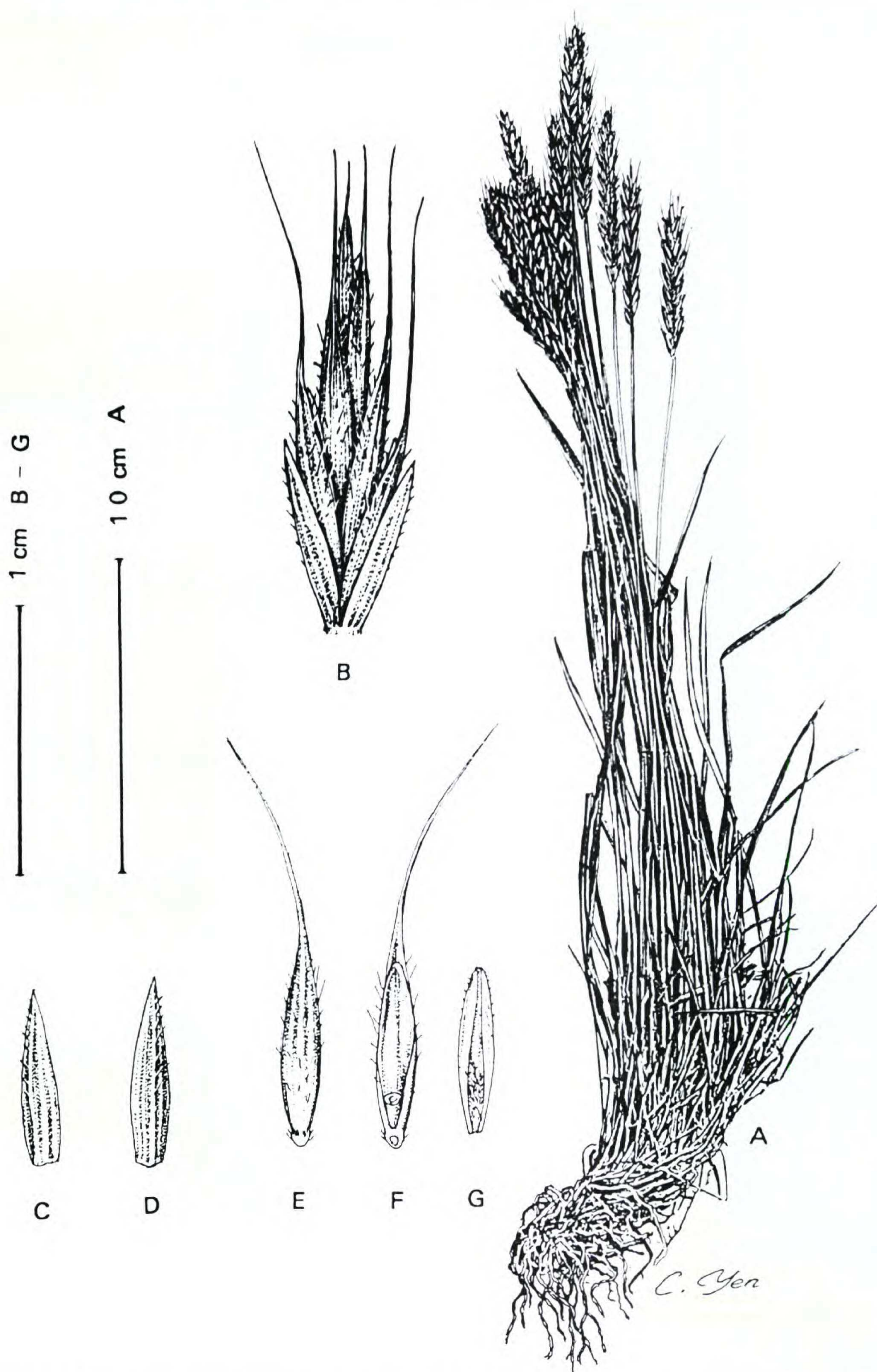


Figure 3. *Kengyilia carinata* (Ovczinnikov & Sidorenko) Yen, J. L. Yang & Baum. —A. Mature plant. —B. Spikelet. —C. Lower glume. —D. Upper glume. —E. Floret beset with sparse long hairs. —F. Ventral view of a floret. —G. Ventral view of a palea.



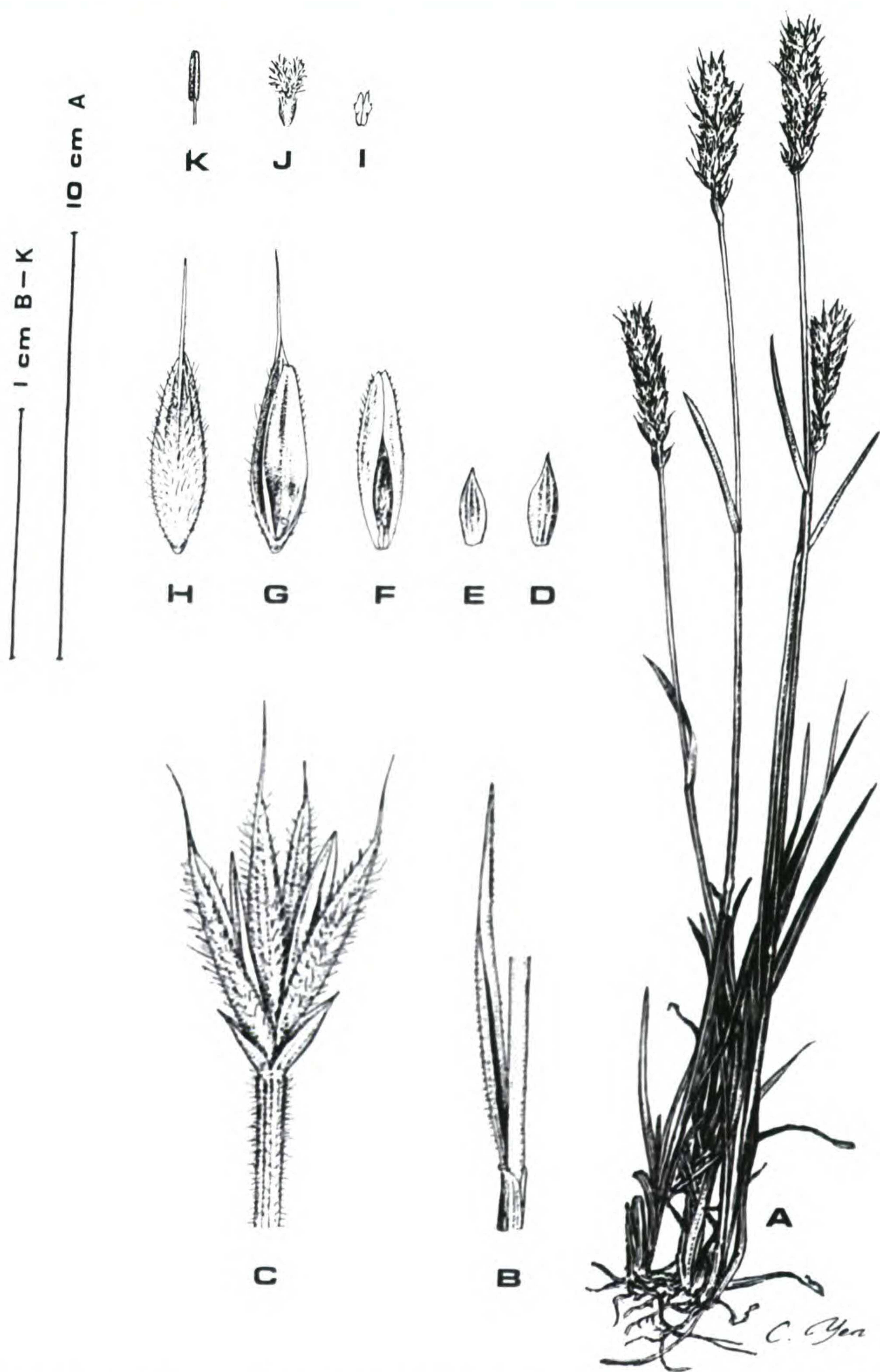


Figure 4. *Kengyilia eremopyroides* Nevski ex Yen, J. L. Yang & Baum. —A. Mature plant. —B. Flag leaf with puberulent blade. —C. Spikelet subtended by hirsute upper part of internode. —D. Upper glume. —E. Lower glume. —F. Ventral view of palea. —G. Ventral view of a floret. —H. Dorsal view of a floret. —I. Lodicule pair. —J. Ovary with stigma. —K. Anther.



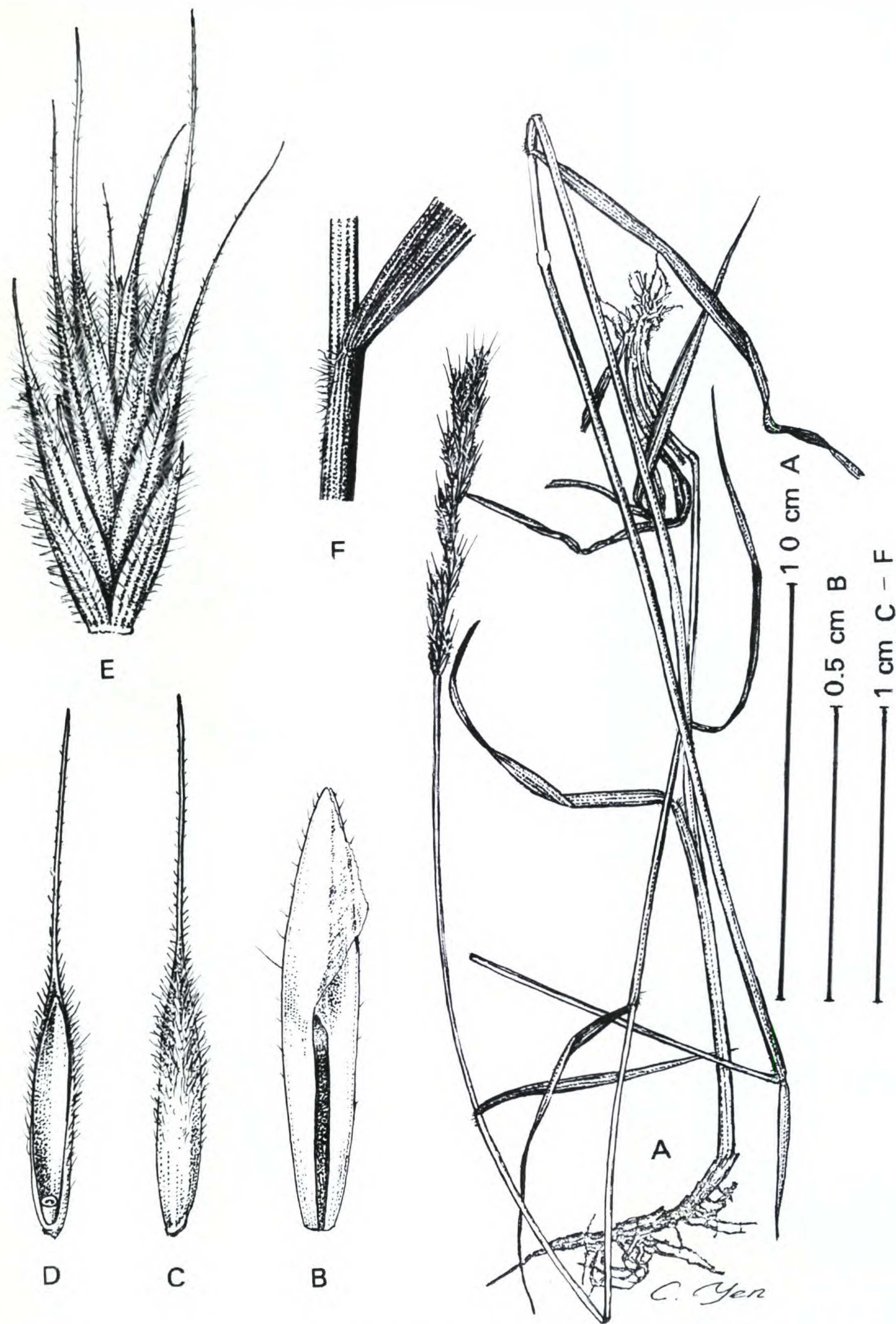


Figure 5. *Kengyilia pulcherrima* (Grossheim) Yen, J. L. Yang & Baum. —A. Mature plant. —B. Ventral view of palea, showing the two hyaline membranous, triangular large appendages on both sides of the upper margins. —C. Dorsal view of a floret. —D. Ventral view of a floret. —E. Spikelet. —F. Upper part of leaf sheath with ciliate margins.



Table 1. Differences between *Kengyilia kryloviana* and *K. habahenensis*.

	<i>K. kryloviana</i>	<i>K. habahenensis</i>
Spike length	3–8 cm	8–12 cm
Spikelet width	5 mm	2 mm
Lemma backs	densely and long pilose	covered with soft short hairs
Palea tips	pointed	short retuse
Habitat	stony and grassy slopes	in <i>Larix</i> forest and bushes and dense vegetation

**6. *Kengyilia kryloviana*** (Schischkin) Yen, J. L. Yang & Baum, comb. nov. Basionym: *Agropyron krylovianum* Schischkin, Fl. Zapod. Sibir. 2: 353. 1928. (Animadvers. syst. ex Herb. Univ. Tomsk No. 2). *Elytrigia kryloviana* (Schischkin) Nevski, Tr. Bot. Inst. Akad. Nauk SSSR, ser. 1, 2: 84. 1936. TYPE: Russia. West Siberia, Altai, Valley of river Chuya (holotype, TK).

*Distribution.* Stony and grassy slopes, rocks and screes of the middle mountain belt in Russia (West Siberia: Irtysh, Altai; East Siberia: Angana-Satan) and Kazakhstan (Northern Balkhash).

Earlier (Baum et al., 1991), we suspected that this species, formerly belonging to *Agropyron* (Tzvelev, 1976: 145), might belong to *Kengyilia*. Essential differences between this species and *Kengyilia habahenensis* Baum, Yen & J. L. Yang are given in Table 1.

**7. *Kengyilia pulcherrima*** (Grossheim) Yen, J. L. Yang & Baum, comb. nov. Basionym: *Agropyron pulcherrimum* Grossheim, Tiflis Bot. Sada [Moniteur du Jardin Botanique de Tiflis] 13–14: 42. 1919 (also Plate 4, fig. 1–5). *Elytrigia pulcherrima* (Grossheim) Nevski, Tr. Sredneaz Univ. Ser. 17: 51. 1934. *E. intermedia* (Host) Nevski subsp. *pulcherrima* (Grossheim) Tzvelev, Novost. Sist. Vyssh. Rast. 10: 31. 1973. TYPE: Turkey. “Prov. Kars, distr. Ardahan, prope Guljabert, in locis stepposis, 25/7/1914, A. Grossheim” (holotype and isotype, LE). Figure 5.

*Agropyron intermedium* var. *ambigens* Haussknecht in Halácsy Consp. Fl. Graec. 3: 437. 1904. *A. ambigens* (Haussknecht) Roshevitz, Fl. Turkm. 1: 191. 1932.

TYPE: Greece. “Iter Graecum, Pindus Tymphaeus prope Malakassi, in schistosis, 18 VII 1886, C. Haussknecht” (isotype, LE).

*Agropyron popovii* Drobov, Feddes Rep. 21: 44. 1925. TYPE: Turkmenistan. “Distr. Askhabad, 1921, M. Popov No. 706” (lectotype, designated by Tsvelev (1976), TAK).

*Distribution.* Russia, Caucasus, eastern and southern Transcaucasia; Turkmenistan; Tian-Shan; Syr Darya; Balkans; and Iran on slopes in steppe.

This species has a unique morphological feature, not found in other *Kengyilia* species and related genera. This is the large, hyaline, triangular appendages on both sides of the upper margins of the palea (Fig. 5B).

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